In the Matter of
United States Patent Application 11/788,978
Inventor: Robert Bonthron DURWARD
Title: Method And Apparatus For Enhancing Fluid Velocities In Pipelines

DECLARATION BY INDEPENDENT EXPERT

I, **Paul Norman Conrad** hereby declare that:

1. I have been asked to provide independent evidence to the United States Patent Office regarding the structure and usage of pigs in pipelines.

2. I have worked in the construction of pipelines since 1966. I started my career as a labourer, and worked my way up to foreman of a pipeline welding crew and then into management. I worked for Parkland Oilfield Construction from the early 1980's until 2004. I held the title of Construction Superintendent when I left Parkland Oilfield Construction in 2004. I am presently a consultant who has been hired as Chief Pipeline Inspector on a pipeline project undertaken by Husky Oil.

3. I have reviewed the Patent Application submitted by Mr. Durward and the Examination Report dated September 24, 2007. The Examiner's reference to an "iron pig" defined as a "crude casting of metal" is clearly not applicable to the pipeline industry. Similarly, the Examiner's reference to a gas lift plunger in United States Patent 4,596,516 (Scott et al) entitled "Gas Lift Apparatus Having Condition Responsive Gas Inlet Valve" is clearly not applicable to the pipeline industry. It is hoped that the background information that I can provide on pigs used in the pipeline industry will prove useful to the Examiner.

4. The pipeline industry uses a number of pigs that serve different purposes and have different names. Many of these pigs consist of a shaft with seals at each end, often referred to as "cups". The cups form a seal with the interior surface of the pipeline. This enables the pigs to be propelled by gas pressure, usually air, down a pipeline. The function that the pig is to perform will determine what additional equipment that the pig possesses. A "scraper" pig, used to scrape wax build up from the interior surface of the pipeline, will have blades or brushes. A drying pig, used to remove small amount of water from inside a pipeline, will have a cylindrical sponge. A smart pig, used to measure or chart aspects of the pipeline, will have measuring equipment and an associated electronics package to record the measurements. A construction pig, used to look for interior construction defects, will have a circumferential metal strike plate to strike any defects impinging on the minimum interior diameter provided in the pipeline specifications. A poly pig, often used in pairs in front of and behind a slug of liquid, is usually a cylinder of liquid impervious material. This list is not exhaustive, but merely consists of a number of examples that come to mind. Many pigs will generally have a body with seal cups at each end, and some additional feature to assist it in performing its intended function. The basic structure of a pig is well known in the pipeline industry. A new function to be performed by a pig, is generally easy to understand when one has a general understanding of pigs.

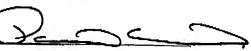
5. In order to increase the speed of a pig passing along a pipeline, one must increase the gas pressure propelling the pig. Huge air compressors are used to provide the pressure required. As

the pressure increases, the danger posed by the pressure also increases. I have seen huge craters formed when a pipeline failed when under 300 pounds per square inch of air pressure. As air pressure is used to propel the pig along the pipeline, air must be removed from the other end of the pipeline, so that the forward progress of the pig is not impeded by air ahead of the pig being compressed.

6. I have been asked to comment on whether I can understand how to build and operate the invention from the description that Mr. Durward has provided. As I understand the concept, Mr. Durward is attempting to speed up flow through a pipeline. If you can increase the speed of fluid passing along a pipeline by three times, you can pass three times the volume of fluid through the pipeline. This allows you to defer building more pipelines, as you can get three times the output through existing infrastructure. It is impractical to do this by increasing pressure, and far too dangerous. Instead, he is going to accomplish this through the use of an electro-magnetic system, in which the pigs have windings that make them respond to an electro-magnet, in a manner similar to high speed trains. He has termed these pigs that can be accelerated through a pipeline "thruster pigs" and the combination of the thrusters pigs and the electromagnets that propel them a "thrusters propulsion system". I would understand them to be the type of pig that is presently used in pairs in front of and behind a slug of liquid, only with additional windings imbedded in the body.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name: **Paul Norman Conrad**

signature: 

Date of signing: **January 02, 2008**

Residence: **Alberta, Canada**